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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,371	04/09/2004	Anders Landin	5181-25901	1212

35690 7590 12/21/2006	**EXAMINER**	
MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.	PATEL, KAUSHIKKUMAR M	
700 LAVACA, SUITE 800	ART UNIT	PAPER NUMBER
AUSTIN, TX 78701	2188	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/21/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/821,371	LANDIN ET AL.
	Examiner	Art Unit	
	Kaushikkumar Patel	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date *1/26/05 7/1105*.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statements (IDSs) submitted on January 26, 2005 and

July 11, 2005 has considered by the examiner.

Specification

2.   The lengthy specification has not been checked to the extent necessary to

determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the

specification.

Claim Objections

3.   Claims 5-7, 18, 22 and 30 are objected to because of the following informalities:

    Claim 5 recites limitation "the other one of the plurality of nodes" in line 2. Claim 5

is dependent of claim 2 through dependency chain. The limitation "the other" is defined

as "another one of the plurality of nodes". Applicant's cooperation is requested

correcting limitation in either parent claim or dependent claim to make all limitations

identical. Claims 6-7, 18, 22 and 30 also contain similar errors.

    Claim 8, recites "an interface to an additional node...the data network" in lines 5-

7. Applicant is advised to change the limitation for example as "an interface included in

an additional node in the multi-node system is configured to send and receive...data

network".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5.   Claims 1-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 16, recites the limitation "if an active device in one of the plurality of nodes has an ownership responsibility for a coherency unit, no active device in any other one of the plurality of nodes has a valid access right to the coherency unit", according to present application specification, page 27, par. [0090], the ownership state indicates whether the device is responsible for providing a copy of coherency unit to another client that requests it. The owned state indicates that the owner has the most recent correct copy and the copy in the main memory may be stale copy, further the owned data can be shared and multiple processors can hold the correct copy of data in shared state so the statement "if one device has an ownership responsibility, no device in other node has valid access right" is not clear. For the remainder of office action, the meaning of the above, interpreted as "line is owned and modified than no other device has a valid access right".

Claim 3 recites limitation "the address packet" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 7, recites limitations "wherein one of the plurality of active device", "an active device of the plurality of active device" and "the active device" in lines 11, 14 and 16 respectively. The limitation "one" and "an" can be interpreted in same meaning and thus "the active device" is open to interpretation and hence lacks antecedent basis for the limitation.

Claim 8 recites limitation "a read access right" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites limitation "the interface is configured to receive a coherency message from the additional node via the inter-node network" in lines 7-8. It is unclear when the interface included in the additional provided connection to inter-node network and how same interface receives a coherency message sent be the same additional node via inter-node network.

Claim 18, further recites limitations "wherein one of the plurality of active device", "an active device of the plurality of active device" and "the active device" in lines 12, 15 and 17 respectively. The limitation "one" and "an" can be interpreted in same meaning and thus "the active device" in line 17 is open to interpretation and hence lacks antecedent basis for the limitation.

Claim 22 also has similar limitations as explained above with respect to claims 7 and 18 above.

Claim 30 recites limitation "wherein one of the means for caching coherency units is configured to request a read access right to another coherency unit be sending an address packet" in lines 13-15. The means for caching data (coherency units) can be

some kind of memory and memory cannot send address packet or request read access

to data.

Claims 3-6, 8-17, 19-21 and 23-29 are also rejected due to their dependency on

rejected claims.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gharachorloo et al. (US 2002/0124144) and Ignatowski et al. (US 6,457,100).

As per claim 1, Gharachorloo teaches a system (fig. 1) comprising:

a plurality of nodes (fig. 1, items 102), wherein each node of plurality of nodes

includes a plurality of active devices (fig. 2, items 106).

Gharachorloo fails to teach distinct address and data network. Ignatowaski

teaches multi-node system with distinct address and data networks (Ignatowaski, figs.

3-5, col. 14, lines 15-17). It would have been obvious to one having ordinary skill in the

art at the time of the invention to include distinct address and data networks as taught

by Ignatowaski in the system of Gharachorloo to improve system bandwidth

(Ignatowaski, col. 14, lines 19-23).

an inter-node network configured to convey coherency messages between each

of the plurality of nodes (Ignatowaski, col. 13, line 55 – col. 14, line 11, Gharachorloo,

fig. 1, item 134);

wherein the plurality of nodes implement a coherency protocol such that if an

active device in one of plurality of nodes has an ownership responsibility for a

coherency unit, no active device in any other one of the plurality of nodes has a valid

access right to the coherency unit (Gharachorloo, pars. [0067], [0123] – [0126], [0138] –

[0141] and [0145] – [0148], teaches coherency states, such as shared, invalid, exclusive

and ownership. Further, Gharachorloo teaches, if a node has cache line that has been

modified, no other node in the system can have a copy of line).

As per claim 2, Gharachorloo teaches in response to the one of the plurality of

nodes receiving via the inter-node network a coherency message indicating that an

active device included in another one of the plurality of nodes is requesting a read

access right to the coherency unit, the active device in the one of the plurality of nodes

is configured to lose the ownership responsibility for the coherency unit and to transition

a write access right for the coherency unit to a read access right (Gharachorloo, pars.

[0159] – [0167], steps of requesting read access to data by one node is transferred to

remote node having exclusive copy of the data and owner of the data supplies data to

requester and status of memory line changed to shared. The line "the requesting node

and the former owner are both storing a shared copy" in par. [0167] teaches loss of

ownership and transition to read access right because shared line cannot have write

access right).

With respect limitations of claim 3, Gharachorloo teaches home and remote protocol engines (par. [0080]), which in response to request from other node sends internal data request and loss of ownership is taught with respect claim 2 above {(pars. [0161] – [0162]), taught as remote protocol engine (RPE) 124 sends a read request to the home node, a read request is received by the home node and routed internally (proxy address packet), sending a read request inherently requires sending of address packet}.

With respect to limitations of claims 4 and 5, Gharachorloo teaches in response to read request initiated by the requested is forwarded to owner node via a home node and owner node sends up-to-date copy of data to requesting node (Gharachorloo, pars. [0159] – [0167] teaches a process) and the memory state is updated to shared as well as the owner of line loses the ownership responsibility and transition to read right as explained with respect claims 1 and 2 above.

With respect to limitations of claim 6, Gharachorloo teaches multi-node system, in which active devices within nodes communicates to each other as well as to active devices in the other nodes, inherently requires sending access right requests (read/write), which is internally searched and if the request is not satisfied internally it is sent the other node as explained with respect to claims 1-5 above. Thus, Gharachorloo teaches another active device within the node requesting a read access right to a coherency unit. With respect to limitation of retaining ownership, Gharachorloo teaches a requester gains the ownership (Gharachorloo, par. [0140]), but it is well known in the art that owned data can remain shared, changing/retaining ownership would be a

design choice (present application specification page 89, par. [0240], "although in some

embodiments the owning device may not retain ownership in either situation") because

changing/retaining ownership can be based on the assumption that the latest device

requesting shared read access may write/modify the data and sending ownership to

requesting device can avoid a subsequent read-to-own request for exclusive right or the

previous owner retains the ownership because the request can be easily upgraded to

exclusive by intra-node transactions.

8.   Claims 1-5 are rejected under **35 U.S.C. 103(a)** as being unpatentable over

Hagersten et al. (US 5,940,860) and Ignatowski et al. (US 6,457,100).

As per claim 1, Hagersten teaches a system (fig. 2) comprising:

a plurality of nodes (fig. 2, items 100, 150, 170), wherein each node of plurality of

nodes includes a plurality of active devices (fig. 2, items 102-106).

Hagersten fails to teach distinct address and data network. Ignatowaski teaches

multi-node system with distinct address and data networks (Ignatowaski, figs. 3-5, col.

14, lines 15-17). It would have been obvious to one having ordinary skill in the art at the

time of the invention to include distinct address and data networks as taught by

Ignatowaski in the system of Hagersten to improve system bandwidth (Ignatowaski, col.

14, lines 19-23).

an inter-node network configured to convey coherency messages between each

of the plurality of nodes (Ignatowaski, col. 13, line 55 – col. 14, line 11, Hagersten, col.

6, lines 15-67);

wherein the plurality of nodes implement a coherency protocol such that if an active device in one of plurality of nodes has an ownership responsibility for a coherency unit, no active device in any other one of the plurality of nodes has a valid access right to the coherency unit (Hagersten, col. 7, lines 33-40).

As per claims 2-5, Hagersten teaches in response to the one of the plurality of nodes receiving via the inter-node network a coherency message indicating that an active device included in another one of the plurality of nodes is requesting a read access right to the coherency unit, the active device in the one of the plurality of nodes is configured to lose the ownership responsibility for the coherency unit and to transition a write access right for the coherency unit to a read access right (Hagersten, col. 10, line 45 – col. 11, line 27, Hagersten teaches that if requesting node is in gI state than external node is in gM state and has exclusive copy of memory line and coherence transformer retrieves data from external device through RRTS (proxy) request and the Mtag is changed to gS).

Claims 7-30 are rejected under **35 U.S.C. 103(a)** as being unpatentable over Gharachorloo et al. (US 2002/0124144), Ignatowski et al. (US 6,457,100) and Hagersten et al. (US 5,886,138) (Hagersten-2, herein after) and (Hagersten et al. (US 5,940,860))

As per independent claims 7, 18, 22 and 30, Gharachorloo and Ignatowaski teaches a multi-node system capable of communicating internally within the node as well as externally to different nodes (inherently active devices in nodes) and

transitioning ownership responsibility/read/write access rights as explained with respect

claim 1-6 above (Gharachorloo, figs. 1-2, Ignatowaski, figs. 1-5). Communicating to

devices within or outside of nodes inherently requires sending address packets and in

response to received address packets sending data through data packets.

Gharachorloo further teaches Home Protocol Engine and Remote Protocol Engine

(Gharachorloo, fig. 5 and par. [0080]) performing sending and receiving of data for

request sent by an active device (Gharachorloo, pars. [0159] – [0167]) but fails to teach

an interface issuing sub transactions. Hagersten-2 however teaches system interface

initiating sub transactions in response to transaction initiated by processing unit within

the node (Hagersten, claim 12). It would have been obvious to one having ordinary skill

in the art at the time of the invention to utilize system interface as taught by Hagersten-2

in the system of Gharachorloo and Ignatowaski to reduce network traffic in improve

system efficiency (Hagersten, col. 5, lines 19-47).

With respect claims 8 and 9, the active device (in any node) must inherently be

able to send the coherency message and subsequently an address packet related to

requested coherency message otherwise the system would not work (cannot

communicate with each other).

With respect limitations of claims 10-11, Gharachorloo teaches HPE and RPE to

send sub transactions as well as receiving data from owner and sending to requester

via an interface (Gharachorloo, pars. [0159] – [0167]) and Hagersten-2 teaches an

interface performing sub transactions (Hagersten, claim 12), which requires interface

sending address packets and corresponding data.

With respect claims 12 and 13, Gharachorloo teaches requesting node and former owner node both sharing a shared copy (Gharachorloo, par. [0167]), which teaches requesting device gaining access right and owner transitioning an access right.

With respect claim 14, Gharachorloo teaches a read request to gain read access right (Gharachorloo, par. [0159]), which is equivalent to read-to-share packet and Gharachorloo further teaches that if the request is not internally satisfied the RPE sends request to home node and home node's (or slave node, if home node is not owning node) HPE sends internal request to retrieve data from the device (Gharachorloo, pars. [0161] – [0167]), the internal request sent by home node's HPE or slave node's HPE (if slave is owning the data) is equivalent to read-to-share-modified packet because it provides the functionality of retrieving data from remote node (Although, such address packets are known in the art and an artesian of ordinary skill in the art would be able use such address packets to distinguish between local access verses remote access, see Hagersten et al. (US 5,940,860), figs. 8-11).

Claims 15-17 are rejected under same rationales as applied to claim 6 above, because as explained with respect claim 6, retaining or transitioning ownership will be a design choice.

Claims 18-30 are also rejected under same rationales as applied to claims 7-17 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kaushikkumar Patel
Examiner
Art Unit 2188

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